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Brown, Smith Wallace Consulting White Paper

# Warehousing: the Foundation of Distributor Profitability

## Techniques for Maximizing Performance

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## INTRODUCTION

The warehouse is where most distributors make it or lose it. Sales is responsible for the top line, but if the warehouse (including inventory management) does not meet the six critical measures of success, all of the sales in the world will not help because you will lose customers quickly.

*Your customers will tell you they expect the following:*

1. I want to get the right product, no unapproved substitutions;
2. I want to get the right quantity—do not send me less or more, both cost me money;
3. I want to receive it at the right time –early or late deliveries cost me money;
4. I want the right quality without having to inspect each item—extra steps cost me money;
5. I want to get the right packaging to make it easy to use;
6. I want to get a fair price.

It is very important to keep the focus on the customer and what they want/need. It is too easy to lose sight of who is most important while working hard to improve the bottom line. When that happens, unexpected consequences cause all kinds of problems.

This paper is focused on the Warehouse. Some people may be surprised by number six above. How does the warehouse affect pricing decisions? It is very simple. Excessive warehouse errors increase the cost of everything. As a result, higher prices are necessary to cover the losses. In contrast, a well run warehouse has lower overall costs of operation. This provides the sales organization with the ability to meet or set competitive pricing because operating efficiencies have provided extra margin in every sale.

The first section starts with a discussion of using metrics to manage the warehouse operations. The right metrics are the key to every other aspect of success. That is followed by a look at the cost of mistakes. It will be shown that errors will have a different cost depending on when and where they occur in the warehouse environment.

In the real world, tracking and managing returns is a headache for most businesses. In many cases, it can make a difference in the profitability of the enterprise. The bottom line effect is more than just the cost of resources necessary to manage the process. "Report cards" will be shown to be effective in tracking and influencing vendor activities and negotiations.

Within most warehouse operations, compliance labeling is important and a critical management requirement, especially with larger customers (retail, MRO, or industrial). These are relatively simple, extra value items that can differentiate one distributor from another.

Labeling, leads to a discussion about traceability and general lot/serial number tracking For many products (especially tools and equipment), having the serial number or other identifying information on the outside of the packaging can be used to improve processing. This will impact product safety issues (potential recalls) and transparency of the supply chain in managing logistics.

Finally, we will summarize the value of implementing methods to improve operations, reduce cost, improve customer service, and ultimately, increase profitability.

## METRICS AND MANAGEMENT

There is an old saying that you can only manage what you can measure. This is absolutely true and important for all distributors to understand. One of the concepts that I teach to business owners and MBA students alike is that managers get paid for one thing and one thing only. That is to move numbers.

Leaders are required to identify the numbers to move, determine where we are, and decide where we want to be—the vision. Because there has been distrust built over time is many organizations, careful and accurate definitions of the numbers are required. Everyone will want to know how each measurement is calculated, where the source data comes from and how they will be reported.

Together, the management team (leaders and managers) needs to agree on the ability to meet the goals (in other words, the goals are realistic). We do not want to set any group or team up for failure. Then the team must approve the allocation of resources to be made available (people, money, equipment) and the target dates to meet the goals. Unless everyone is in alignment, it will not work.

If everyone understands how the metrics are defined, they can then take responsibility for moving the numbers the right distance in the right direction in the approved time frame. On a continuing basis, all that is required is to make sure the numbers are available to those who are taking responsibility.

People need to be able to track how they are doing at each step along the way. Having access to the metrics help make employees more effective at getting things done. Ease of use and availability are keys to gaining the greatest value of metrics in management

If we accept that numbers are needed to manage effectively, then the question is which numbers do we want to use? While there are many similarities in all warehouse operations (a receiving function, put-away, pick, pack, and ship) there are many differences based on vertical markets, competitive advantage, and automation.

Warehouses that specialize in product that are sold by length (anything from wire to carpet) require measuring and cutting stock, tracking remnants, and scrap management. Products that require serial numbers have a whole set of parameters that others do not.

Equipment and tools may have warranty tracking, maintenance, repair, and service components. In some verticals, units of measure are critical—and often not well controlled. Dating is a necessary where expiration dates are important (everything from batteries to chemicals).

There are also differences in operations that require different measures. A warehouse using sophisticated methods of wave picking in a "very narrow aisle" environment will need different capabilities than one where customers are allowed to roam the aisles to pick their own material.

It is mandatory that each operation investigate and identify the metrics that are necessary for them to be successful. Following are some of the standard metrics that form the basis for measuring success in many warehouses:

- Line items picked per hour (and per team or individual per hour);
- Shipping errors identified per day (and per team or individual per day);
- Product turns (annual);
- Service levels (includes product shipped on time and in the correct quantity);
- Freight recovered;
- Inventory accuracy;
- Return Material value recovered or lost;
- Mean time to put away (from receipt on the dock);
- Mean time to start pick (from receipt of order).

This is not an all inclusive list. There are many other metrics that will be meaningful to specific operations. These numbers can also be merged with other data. For example, using sales data from the Customer Relationship Management side combined with service levels and error rates can yield information on customer satisfaction and the drivers behind movements in the other numbers.

Good metrics reported timely will provide management with tools to react faster to situations. Waiting for month end data is not valuable in a world moving at lightning speed. Monthly numbers are good for assessing blame. Daily, hourly or even real time results are used to catch and correct situations before they become problems.

A very basic example is using the capability to capture weights of all products being sold. It is then possible to estimate the weight of any "to be picked" package. By simply weighing the picked package and comparing that weight to the expected weight before it goes on a truck, you can capture about 90% of all shipping errors. You will not stop the shipment of a red unit as opposed to a blue one, but it is easy to stop the shipment where a case of product was picked instead of an individual item.

## COST OF MISTAKES

Given all of this information, it is also important to be able to determine the cost of a mistake. As indicated, the cost is variable depending on when it is caught. For example, a shipping error caught before the packing box is sealed is significantly less costly than one found at the customer's location when a package is opened to get an individual part for immediate use. Plus, this type of discovery incurs additional soft costs for lost customer satisfaction on top of all expenses related to the return and replacement of the incorrect part.

*Some of the costs associated with warehouse errors (even the ones caused by incorrect sales documents or influenced by others) include:*

1. Extra processing to eliminate errors (this occurs when there are a large number of errors and extra steps are implemented to check and even recheck picks to make sure the right number of the right product are pulled for packing and shipping).
2. The cost of shipping both ways if incorrectly sent material has to be returned. Where replacement parts have to be shipped overnight or even same day, the extra cost is rarely recoverable.
3. The lost margin if a significantly more expensive item is shipped and billed at the price of the expected item (the other scenario rarely happens where a customer is charged for a more expansive item, but a cheaper one was sent—customers find and complain about those quickly).
4. There is the cost of extra handling of material, paper, invoicing, credit memos, and customer service time to correct the error and placate the customer.
5. The soft cost of damage to the firm's reputation is much more difficult to determine, but it can be a relatively large number.
6. There is potential damage to parts or equipment that makes it impossible to return the wrong items to the shelf for a future sale.
7. There is the potential cost of having to purchase the correct product on an emergency basis at a much higher cost than was used to calculate the selling price.
8. There are long term costs associated with reduced customer retention due to ongoing problems with erroneous shipments.
9. There are long term costs associated with reduced customer retention due to late shipments, wrong quantities, and lack of quality.

The cost of lost loyalty is one of the most difficult to quantify. It is proven that a disgruntled customer will tell many more prospects than a satisfied customer. Measuring lost opportunities due to bad reputation is almost impossible to do accurately. Distributors who hire outside firms to measure such data are often surprised to learn what the marketplace thinks of them.

Surveys and the metrics they can create are often valuable management tools, but outside the scope of this paper. Surveys require specialists who know how to word questions, select participants, and report data to be useful. They need to be done on a regular basis and the results must be compared and reported to be of the greatest benefit to the organization.

Adding up all of the potential charges will put the cost of errors into perspective. Industry experts have published numerous papers showing individual costs (such as $45 to $70 for an invoice and $10 to $25 for a credit memo), but there is no accepted total for a warehouse error. For the purposes of this paper, it would be easy to defend a conservative estimate of $200 per error. The chart below will allow you to estimate the number of dollars in new sales that are required just to generate sufficient net dollars to cover the cost of a single error.

| Net Profit before taxes % | 8 | 4 | 2 |
|---|---|---|---|
| Additional sales required to pay for a $200 error | $2,500 | $5,000 | $10,000 |

The numbers grow rapidly. Assume one only does 100 shipments per day and achieves 99% accuracy (one error per day). In a year of 220 working days, that generates 220 errors. At $200 per error there is an annual cost of $44,000. At the 2% level, that would require $2.2 million of additional sales to cover the cost of those errors. These are significant numbers.

In addition to the cost of any specific error is the cumulative effect of poor customer service. Over time, it may force some customers to stop dealing with their current supplier and buy from another source. There is no charge or value associated with the loss of a customer in the above chart. There are two types of costs that should be considered. The first is the value of the lost customer. What profitability would they have added to the bottom line over the next period?

Research by Paul Wang at Northwestern University uses the concept of Customer Lifetime Value (CLV) to quantify the cost of losing customers. CLV uses revenue, margin, and customer retention rates to compute the current value of a customer during a projected lifecycle. In simple terms, this means we can estimate the total value that a customer (usually by some combination of demographic data like size, type, age, etc,) will provide in any give year.

If we assume warehouse errors can be directly blamed for the loss of some number of customers and multiply that times the projected net revenue that would be generated from that category of customer, we can estimate an impact number. Keeping the numbers simple, we might guess that our average customer purchases $10,000 annually at a 25% gross margin. That means that each lost customer reduces the annual gross margin by $2500. If only 10 customers are lost in a year, the reduction in gross margin is $25,000. Lose eight customers per month and almost a quarter of a million dollars is lost every year. That is a major impact for most distributors.

Understanding these costs helps us realize the significant impact that warehouse errors can have on the profitability of the business. In a future white paper on CRM (Customer Relationship Management), we will discuss how to recognize that a customer has been lost. Our research shows that many customers stop buying for long periods before the distributor even misses them.

The second type of cost to consider is the cost of acquisition of a new customer to take the place of the lost customer. This has to include sales time, administration to set up the customer in the system and perform a credit check (assuming you actually do a credit check and establish a credit limit). It also should consider any extra effort that is required learning the new customer's requirements during the first few sales.

An easy way to look at the cost of acquisition is to take the total budget spent on marketing and sales and divide by the number of new customers added in a given period. Of course, much of the expenditure is necessary to encourage current customers to keep buying or to encourage purchases of specific items. Estimates of anywhere from $500 to $2500 per new customer can be reasonable.

Then there is the absolute cost of a lost sale (even if it does not lead to the loss of a customer) when a product cannot be found for immediate delivery (whether or not it was put away wrong, accidentally shipped due to a picking error, or on the receiving dock, but no one knew it was there). On top of the lost gross margin, there may be higher levels of customer dissatisfaction and a negative impact on internal personnel when management attempts to assess blame for the mistakes.

## BENEFITS OF A STREAMLINED PROCESS TO MINIMIZE ERRORS

There is another side to the coin. That is the value of a quality process that brings customers back and keeps them. A well run warehouse that minimizes errors can be a competitive advantage. It is something that can be sold.

Documented error rates that are lower than the competition, guaranteed service levels based on qualitative data, and the ability to deliver superior service all win customers. Using the Customer Lifetime Value calculation, keeping a customer one extra year on average can add many thousands of dollars to the bottom line. Reduce the number of lost customers in conjunction with increasing their lifetime value and the results are impressive.

It is even better when you consider the total saved costs of not having to pay for extra shipping, extra handling, extra paperwork, extra customer service calls, and extra soothing of irate customers. Then calculate the lower cost of customer acquisition based on your reputation for top notch service and the wins keep coming in.

Fixing warehouse errors has so many positives; it is hard to understand why so few distributors do not focus on this easily managed area. Especially in the current economic situation, here is a way to reduce your costs and those of your customers. It is truly a win-win situation.

## RETURN MATERIAL TRACKING

In the supply chain, there are multiple reasons that product must be (or is) returned to a supplier from a customer. It can be from an end user to the distributor or from the distributor to the manufacturer. In all cases, it can prove to be a nightmare of forms, lost information, and manual processes that create excessive paperwork, lost productivity, and reduced profits.

*Some of the major reasons for returns are:*

- A wrong product was shipped (and the value was less than the customer was going to be charged);
- The incorrect quantity was shipped (not enough to fill their customer order so they do not want the inventory or there was too much and the item does not turn enough to be worth the extra handling even if the excess inventory was not billed);
- The product is damaged during shipping due to inadequate or inappropriate packaging;
- Poor product quality that does not pass predefined inspection requirements;
- The product arrived late and the customer used an alternative supplier;
- The customer decides to no longer carry product (obsolete inventory);
- The customer wants to recover cash by returning non moving products.

No matter what the reason, a complete process is necessary to initiate the process, track the material, handle it properly, issue credit memos, and finally, recover costs. In a perfect world, the process would be relatively simple.

When a customer initiates the return, it requires efficient handling by customer service personnel. They first must be able to verify that the inventory was actually purchased from their organization and then relate the purchase to a specific Purchase Order, shipment, and invoice.

Next, a shipping label with an easy to read bar code (linear or 2D) is generated which exactly identifies the material being returned and is sent to the customer by email (as an attachment) or FAX. The label provides a link to all of the electronically stored information that the CSR (Customer Service Representative) already researched and captured.

When the product arrives at the supplier's receiving dock, it is positively identified by the bar code and instructions for its disposition are available to the receiving clerk. It may be held for testing, it may be inspected and returned to stock, or it may be cross docked to return to the manufacturer.

All of the internal paperwork is completed by the computer and the proper credit memos issued, less any restocking charges. Restocking charges can be determined by the product category cross referenced to the specific customer. If there was shipping damage, the system should assist the CSR in completing all necessary insurance claim forms and track them to payment.

Any material that is to be returned to the next level supplier (importer, master distributor, or manufacturer) will be properly identified with a custom shipping label that meets the supplier's specifications. The label will be applied to the package and it is then ready to be forwarded on without additional human intervention.

The system will track the physical return of the merchandise based on the bill of lading. Once it has left the shipping dock, the application should follow up to make sure appropriate credit memos are issued and applied. The electronic paper trail will be available at any point to track the current status of any individual return or all returns to a specific supplier.

The electronic system will eliminate the "spreadsheet in the drawer" that has been traditionally used to track and follow up as best as possible on returns. Through CSR access to information, both customers and vendors will have the ability to access and inquire against the database to verify the status of any given return.

## REAPING ADDITIONAL BENEFITS THROUGH REPORT CARDS

Once again, it is obvious that accuracy and real time information can improve the operational efficiency of any process. Reduced costs in processing, increased accuracy in reporting, and an overall improvement in trust between trading partners will have many benefits.

Returns are just one of many supplier metrics which can assist a distributor in managing their warehouse. By using actual results, it is possible to create a "Vendor Report Card" that provides a picture of what is the true cost of doing business with an individual company. While this will be covered in more detail in a later White Paper on Business Intelligence, it is worth a short overview here.

*The Vendor Report Card would include calculations for all aspects of the vendor experience. Among the many items to be measured and reported are:*

- Shipping accuracy (recent, running averages, and annual accumulation) for:
    - o Product accuracy
    - o Quantity accuracy
    - o Timing accuracy (this also helps to determine lead times for ordering)
    - o Quality measures
    - o Compliance labeling accuracy
- Damaged goods received (did not pass inspection or are returned by our customer)
- Billing accuracy
- Shipping costs
- Reliability of drop shipments
- Value of add on services
    - o Training
    - o Spiffs
    - o Marketing material
    - o Marketing support
    - o Co-op monies
    - o Ship and Debit concessions
    - o Support at shows or other venues

These and other metrics should be automatically collected and included in the vendor report. Then, when the time comes to negotiate with a vendor for future pricing, there is an objective measure of their performance and an accurate picture of the cost that has been incurred due to their errors. Having an accurate picture of the existing relationship will put any buyer in the strongest position to negotiate the best deal possible.

## COMPLIANCE LABELING AND ELECTRONIC DATA INTERCHANGE (EDI)

When dealing with the Big Box stores and ORMs, it is critical to get the shipping labels and merchandise labels exactly right. There are often penalties for mislabeled products. In addition, it increases the cost of handling for everyone in the supply chain.

Labels include human and machine readable information. The printed data is relatively easy, although there are often errors in placement and size. The machine readable requires very accurate printing and the use of inks (or thermal impressions) and/or electronics to assure readability in any environment, especially after being exposed to less than pristine shipping and handling conditions.

There are standard linear barcodes, reduced space symbology (takes less room on the label), 2D barcodes (many different formats some of which are error correcting), and electronic including passive and active RFID (Radio Frequency Identification). Each form of labeling has its own requirements to provide high levels of readability and reliability.

Properly produced labels support the use of electronic sorting equipment that is capable of recognizing a code as the package passes a reader at a relatively high speed. In order to work properly, there are three major elements that must come together. First, the label must be on the correct side of the package. Then it must be oriented in the correct direction (yes there is software which will correct for off center, skewed labels, but the standard is to not need them). Finally, the print must be clear and easy for cameras to read accurately (other than RFID information). This information is then used to control the conveyor system as an aid to sorting and subsequent handling.

Product sent to more sophisticated users (this includes the big box stores, larger MRO facilities, and most major manufacturers or OEMs) require very specific labeling standards. The problem is there are very few true standards that work across industry or even company lines. Any software package used must have the flexibility to enter label definitions and have them stored by customer. Then, the system is responsible for generating the appropriate label when the order is received based on the "ship to" information.

Once labeling is enabled in any supply chain, everyone can benefit. It helps to reduce errors in shipping, receiving, picking, and packing. Proper labels and "license plates" on pallets make it possible to use advanced EDI (Electronic Data Interchange) transactions such as electronic receiving and Evaluated Receipts Settlement (ERS involves automatically matching the electronic PO to the paperless receipt and the electronic invoice that is part of the advanced ship notice—all using standard EDI documents which ultimately and automatically triggers an electronic payment to the supplier).

One big new area of responsibility is the potential need for a recall or for ongoing service. In cases of equipment, the ability to provide warranty or maintenance service based on serial numbers can be very important in terms of customer service and safety. A future article will cover the service aspects of the distribution business. Here it is important to understand that proper labeling allows tracking of individual sales to specific customers.

When a product is sold, labels on the outside of a product allow an individual serial numbered item or "lot" identification to be assigned to an invoice without having to search and pick a specific box off of a shelf. When the warehouseman picks the product, a portable barcode reader will ask to "read" the serial or lot number. At that point, the product is attached to the order for all future reference.

The system then allows that information to be retrieved for many different reasons, including: scheduled maintenance; recalls; warnings; and follow up contract to sell consumables or other associated products. As outlined above automating this process will significantly improve any distributor's metrics and help them achieve financial and operating goals.

## INVENTORY TRANSPARENCY

Supply Chains today require transparency to operate efficiently. That means it is important to know where a product is at all times. It should be easy to know what is on the shelf, what is committed, what is on order for an individual customer, and what is back ordered.

Transparency can take many different forms. In a perfect world where not so perfect things happen, there would be a greater ability to react to situations in real time. For example, if a product is ordered for a future delivery date and the system knows the shipping lead time, it can generate an automatic request to verify that a scheduled shipment will take place at the appropriate number of days in advance.

The supplier's computer (or CSRs if they are not that automated) should be able to determine if the proper product is on the shelf and available for shipping when promised. If there is any problem, an electronic notice should be sent indicating that there will be a problem with an on-time delivery.

Knowing this in advance, means it is possible to either make other arrangements or to at least call the customer and let them know a delay is expected. Eliminate the surprise and the impact to the customer is minimized. Customer service metrics and satisfaction are enhanced which ultimately improves customer loyalty.

This entire process should be automated. Exception reports and alerts based on the customer responses can help manage the customer relationship and provide the operations manager with information to determine the best course of action.

With more sophisticated tools, it will be possible to track all inventory movements as they occur. It is not much of a leap to foresee the day when a complete inventory can be taken every evening by allowing the RFID scanners to search the warehouse and identify every product, where it is, and how many there are. Discrepancies will be known the day they occur and complete transparency will help streamline warehouse processes.

Each of these capabilities will help the warehouse team to run as efficiently and effectively as possible. As we wait for technology to catch up with utopia, focusing on transparency will help prepare any warehouse to adopt new processes as they become available.

## FINAL COMMENTS AND CONCLUSIONS

The bottom line is obvious. A well run warehouse is the cornerstone of a profitable distribution business. It will provide additional profits and will help drive customer loyalty. Competitive advantage is gained when the sales force can point to high service levels (that are clearly documented) and reasonable costs.

Automation is a major factor in this success. It starts by being able to define and track metrics. How are we really doing —and in real time? We are not interested in what happened last month (well, we are, but not for the purpose of fixing a problem). The data we need is only minutes old. Our staff needs to be able to react right now to correct problems before they reach the customer.

Automation allows us to accurately know where we are and where we are going. Properly generated reports will give us a "report card" on every facet of the warehouse process. Over time, it is possible to fine tune each aspect of the operation to create a competitive machine that can survive and prosper in any economic environment.

While some look at EDI as old technology, it still works and is in use in many supply chains. The ability to take advantage of EDI capabilities and tie that into compliance labeling will provide benefits for everyone in the chain. Distributors who want to deal with the big box stores, sophisticated MRO operations or OEM plants must comply already. Now it is a matter of spreading the valuable processes to the rest of the industry.

Transparency is the key word for tomorrow. Knowing where every item of inventory is stored, when it is moved, and being able to track it to the customer will provide greater information, metrics, and ability to manage. There will still be room for human intuition and gut feel, but it can be tracked and measured. Management will get better because they will be able to see the numbers move in real time. It will be possible to make process corrections before errors become overly costly.

Automation is going to play an expanding role in the warehouse. Future capabilities may force us to rethink the way we have always done things. Those businesses that rise to the occasion will be rewarded with competitive advantage, greater market share, and (of course) greater profits.

## ABOUT THE AUTHOR

Steve Epner is the founder of the Brown Smith Wallace Consulting Group. Steve is also an adjunct professor of Innovation and Entrepreneurship in the graduate program at the John Cook School of Business at Saint Louis University and is a member of the Center for Supply Chain Management Studies. In addition, Steve is a member of the faculty at the University of Industrial Distribution and Arizona State University for the Certified Professional Manufacturers Representative program. Steve has a Bachelor of Science in Computer Science (1970) and a Master of Science (2005) from Purdue University.

## ABOUT BROWN SMITH WALLACE CONSULTING

The Brown Smith Wallace Consulting Group has been serving the distribution community for more than 20 years through the publication of various Software Guides, an online evaluation center and resource center at www.software4distributors.com and assisting companies who need help selecting the best software packages for their business and maximizing the benefits from their investment.

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